## MARKED UP VERSION OF CLAIMS

Claim 1. An automatic balancing centrifugal apparatus by fluid compensation, comprising:

(a) rotors on which a plurality of buckets are mounted;

(b) a centrifuge motor for rotating said rotors;

(c) a load measurement mechanism, which is installed so as to lift and lower within the rotation trace of said buckets;

(d) a position sensing mechanism for sensing whether or not each of said buckets is positioned above said load measurement mechanism;

(e) a fluid compensation mechanism for injecting a fluid into said buckets or sucking the fluid from the buckets; and

(f) a main control part for controlling the overall operations of each of said elements and controlling said fluid compensation mechanism so that the loads of said buckets can become equal to each other.

Claim 2. The automatic balancing centrifugal apparatus by fluid compensation according to claim 1, wherein the arms of said rotors have the same length from the center of a shaft and to be conformal to each other.

Claim 3. The automatic balancing centrifugal apparatus by fluid compensation according to claim 1, wherein said load measurement mechanism comprises:

(a) a loading plate to which the load of said buckets are applied;

(b) an elevation motor for lifting or lowering said loading plate toward said buckets (140);

(c) a screw rotation shaft which is axially connected with said elevation motor;

(d) an elevation shaft for supporting said loading plate with being screwed to said screw rotation shaft;

(e) a linear motion guide means for guiding a up-and-down motion of the loading plate;

(f) a load sensor for measuring the load applied to the loading plate; and

(g) position sensing means for sensing the uppermost and lowermost positions of the loading plate.

Claim 4. The automatic balancing centrifugal apparatus by fluid compensation according to claim 1, wherein said fluid compensation mechanism comprises:

(a) a fluid storage tank in which a fluid is stored and a fluid opening are formed in a given place;

(b) a nozzle which injects the fluid into said buckets or sucks the fluid from said buckets;

(c) pumping means which is connected to said fluid opening to exhaust the fluid to the nozzle or to suck the fluid from the nozzle;

(d) a connection tube for connecting said pumping means with said nozzle;

(e) a nozzle support for supporting said nozzle so as to be positioned at the middle of said buckets;

(f) an elevation plate which elevates and lowers while supporting said nozzle support;

(g) a linear motion guide means for guiding an up-and-down motion of said elevation plate smoothly;

(h) an elevation motor which is fixed on a base;

(i) a screw shaft which is axially connected with said elevation motor;

(j) a slide center which is fixed at the center of said elevation plate and which is screwed with said screw shaft; and

(k) position sensing means for sensing the uppermost and lowermost positions of the movement of said elevation plate (183).

Claim 5. The automatic balancing centrifugal apparatus by fluid compensation according to claim 4, wherein said buckets are formed as a cylindrical body with the lower surface closed, a plurality of sample holding holes for holding sample cylinders being formed within said buckets and a nozzle opening, through which a nozzle enters and exits, being formed at the center of said buckets.

Claim 6. The automatic balancing centrifugal apparatus by fluid compensation according to claim 5, wherein said pumping means is a single reversible pump capable of sucking and exhausting the fluid.

Claim 7. The automatic balancing centrifugal apparatus by fluid compensation according to claim 6, wherein the center of said loading plate and said nozzle are located on the same vertical line.

Claim 8. The automatic balancing centrifugal apparatus by fluid compensation according to[any one of claims 1-7]claim 1, wherein said position sensing mechanism comprises a slit disc, which is axially connected with the middle of the motor shaft and in which slits indicating the positioning of each of the buckets are formed on the circumference thereof in a radial direction, and a bucket positioning sensor which comprises a photocoupler including a light emitting element and a photodetector, which are installed on the opposite sides of a groove into which the circumference of the slit disc is interposed.

Claim 9. The automatic balancing centrifugal apparatus by fluid compensation according to claim [8]2, wherein said position sensing mechanism comprises a slit disc, which is axially connected with the middle of the motor shaft and in which slits indicating the positioning of each of the buckets are formed on the circumference thereof in a radial direction, and a bucket positioning sensor which comprises a photocoupler including a light emitting element and a photodetector, which are installed on the opposite sides of a groove into which the circumference of the slit disc is interposed.

Claim 10. The automatic balancing centrifugal apparatus by fluid compensation according to claim 3, wherein said position sensing mechanism comprises a slit disc, which is axially connected with the middle of the motor shaft and in which slits indicating the positioning of each of the buckets are formed on the circumference thereof in a radial direction, and a bucket positioning sensor which comprises a photocoupler including a light emitting element and a photodetector, which are installed on the opposite sides of a groove into which the circumference of the slit disc is interposed.

Claim 11. The automatic balancing centrifugal apparatus by fluid compensation according to claim 4, wherein said position sensing mechanism comprises a slit disc, which is axially connected with the middle of the motor shaft and in which slits indicating the positioning of each of the buckets are formed on the circumference thereof in a radial direction, and a bucket positioning sensor which comprises a photocoupler including a light emitting element and a photodetector, which are installed on the opposite sides of a groove into which the circumference of the slit disc is interposed.

Claim 12. The automatic balancing centrifugal apparatus by fluid compensation according to claim 5, wherein said position sensing mechanism comprises a slit disc, which is axially connected with the middle of the motor shaft and in which slits indicating the positioning of each of the buckets are formed on the circumference thereof in a radial direction, and a bucket positioning sensor which comprises a photocoupler including a light emitting element and a photodetector, which are installed on the opposite sides of a groove into which the circumference of the slit disc is interposed.

Claim 13. The automatic balancing centrifugal apparatus by fluid compensation according to claim 6, wherein said position sensing mechanism comprises a slit disc, which is axially connected with the middle of the motor shaft and in which slits indicating the positioning of each of the buckets are formed on the circumference thereof in a radial direction, and a bucket positioning sensor which comprises a photocoupler including a light emitting element and a photodetector, which are installed on the opposite sides of a groove into which the circumference of the slit disc is interposed.

Claim 14. The automatic balancing centrifugal apparatus by fluid compensation according to claim 7, wherein said position sensing mechanism comprises a slit disc, which is axially connected with the middle of the motor shaft and in which slits indicating the positioning of each of the buckets are formed on the circumference thereof in a radial direction, and a bucket positioning sensor which comprises a photocoupler including a light emitting element and a photodetector, which are installed on the opposite sides of a groove into which the circumference of the slit disc is interposed.

Claim 15. The automatic balancing centrifugal apparatus by fluid compensation according to claim 8, wherein a plurality of slits for measuring the rotational speed of said buckets are formed on the circumference of said slit disc in a radial direction; said apparatus further includes a photocoupler for measuring the velocity, which comprises a light emitting element and a photodetector, which are installed on opposite sides of a groove into which the circumference of said slit disc is interposed; and said main control part controls the rotational speed of said centrifuge motor based on a sensing signal from said photocoupler.

Claim 16. The automatic balancing centrifugal apparatus by fluid compensation according to claim 9, wherein a plurality of slits for measuring the rotational speed of said buckets are formed on the circumference of said slit disc in a radial direction; said apparatus further includes a photocoupler for measuring the velocity, which comprises a light emitting element and a photodetector, which are installed on opposite sides of a groove into which the circumference of said slit disc is interposed; and said main control part controls the rotational speed of said centrifuge motor based on a sensing signal from said photocoupler.

Claim 17. The automatic balancing centrifugal apparatus by fluid compensation according to claim 10, wherein a plurality of slits for measuring the rotational speed of said buckets are formed on the circumference of said slit disc in a radial direction; said apparatus further includes a photocoupler for measuring the velocity, which comprises a

light emitting element and a photodetector, which are installed on opposite sides of a groove into which the circumference of said slit disc is interposed; and said main control part controls the rotational speed of said centrifuge motor based on a sensing signal from said photocoupler.

Claim 18. The automatic balancing centrifugal apparatus by fluid compensation according to claim 11, wherein a plurality of slits for measuring the rotational speed of said buckets are formed on the circumference of said slit disc in a radial direction; said apparatus further includes a photocoupler for measuring the velocity, which comprises a light emitting element and a photodetector, which are installed on opposite sides of a groove into which the circumference of said slit disc is interposed; and said main control part controls the rotational speed of said centrifuge motor based on a sensing signal from said photocoupler.

Claim 19. The automatic balancing centrifugal apparatus by fluid compensation according to claim 12, wherein a plurality of slits for measuring the rotational speed of said buckets are formed on the circumference of said slit disc in a radial direction; said apparatus further includes a photocoupler for measuring the velocity, which comprises a light emitting element and a photodetector, which are installed on opposite sides of a groove into which the circumference of said slit disc is interposed; and said main control part controls the rotational speed of said centrifuge motor based on a sensing signal from said photocoupler.

Claim 20. The automatic balancing centrifugal apparatus by fluid compensation according to claim 13, wherein a plurality of slits for measuring the rotational speed of said buckets are formed on the circumference of said slit disc in a radial direction; said apparatus further includes a photocoupler for measuring the velocity, which comprises a light emitting element and a photodetector, which are installed on opposite sides of a groove into which the circumference of said slit disc is interposed; and said main control part controls the rotational speed of said centrifuge motor based on a sensing signal from said photocoupler.

Claim 21. The automatic balancing centrifugal apparatus by fluid compensation according to claim 14, wherein a plurality of slits for measuring the rotational speed of said buckets are formed on the circumference of said slit disc in a radial direction; said apparatus further includes a photocoupler for measuring the velocity, which comprises a light emitting element and a photodetector, which are installed on opposite sides of a groove into which the circumference of said slit disc is interposed; and said main control part controls the rotational speed of said centrifuge motor based on a sensing signal from said photocoupler.